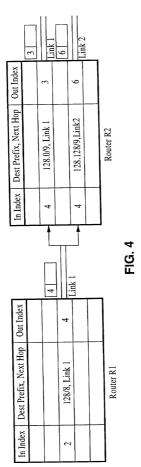


┌	Schemes	Applicability	Lookup Time	Memory	Update Time	Multicast
Z	Patricia	1st, 2nd upto Last Hop Router	O(log(n))	Low	Low	No
0	DP Trie	1st, 2nd upto Last Hop Router	O(log(n))	Low	Low	No
z	LPCTrie	1st, 2nd upto Last Hop Router	O(log*(n))	High	Low	Yes
ر	Lulea	1st, 2nd upto Last Hop Router	<<0(log(n))	Low	High	No
0	CAM	1st, 2nd upto Last Hop Router	0(1)	1	High	Yes
Д	DRAM	1st, 2nd upto Last Hop Router	0(1)	High	High	No
ت	Tag Switching	2nd upto Last Hop Router	0(1)	High	High	Yes
0	MPLS	2nd upto Last Hop Router	0(1)	High	High	Yes
Д	IP Switching	2nd upto Last Hop Router	0(1)	High	High	Yes
Н	CLUB	2nd upto Last Hop Router	0(1)	ųвін	Low	No

<u>Ε</u>



10 Destination Address Cluster Number Data 144.16.192.1 3 Data 12 14 16.192.1 14 16

FIG. 5

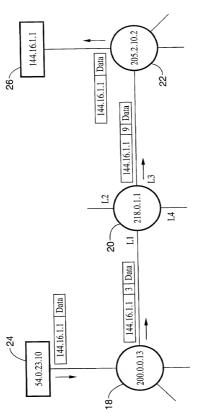


FIG. 6



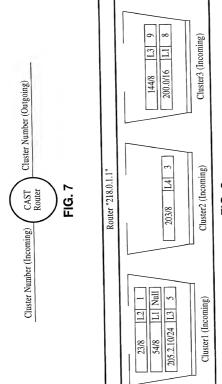


FIG. 8

k Cluster Number (Outgoing)	6	
Next Hop Link	L3	
Prefix Entry	144/8	

FIG. 9

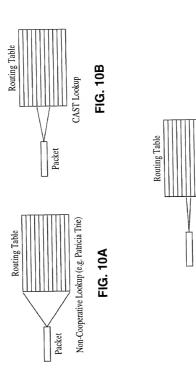


FIG. 10C

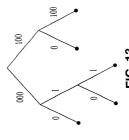
Cooperative Lookup (e.g. Tag Switching)

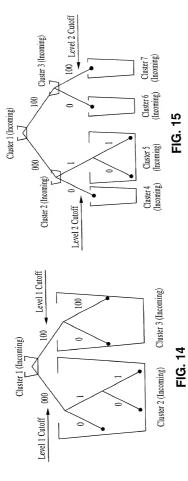
Applicability	2nd upto Last Hop Router	1st, 2nd upto Last Hop Router	2nd upto Last Hop Router
Technique	Patricia	Symmetric	Link

Ŧ	_
7	_
_	٠
Ç	5
ī	ī
-	

Prefix	Next Hop Link	Cluster Number (Outgoing)
*0000	1.2	2
 *01000	13	3
*11000	17	2
1000*	17	4
100100*	1.2	1

FIG. 13





The party country of the country of

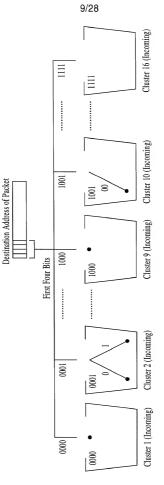
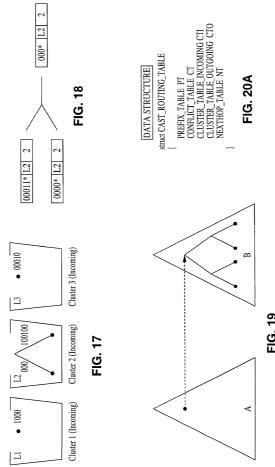


FIG. 16



The state of the s

	17 1.34	41.12	11.3 51.34	1.12
T)	OR CLUSTER TABLE (OUTGOING) OR CONFLICT TABLE)			
	(TO LEFT CHILD			
L	POINTER	SKIP	CHILD PREFIX SKIP	CHILD
	PREFIX TABLE	¥.		
TABLES				
0.00				

H	POINTER	(TABLE (OUTGOING))			17 bits
CONFLICT TABLE	~	IILD) (TO CLUSTER			
	POINTER	(TO LEFT CHILD)			15 bits
	6	5	1	Γ	

CLUSTER TABLE (OUTGOING)	LUSTER NUMBER (OUTGOING) POINTER (TO NEXT HOP TABLE)		7 bits
CLUSTER TABI	CLUSTER NUMBER (OUTGOING)	•••	17 bits
CLUSTER TABLE (INCOMING)	PATRICIA START LENGTH	•••	5 bits

NEXTHOP TABLE NEXTHOP	•	
--------------------------	---	--

FIG. 20B

```
Search prefix_table(packet.cluster_no_incoming, patricia_start_length, packet.destination, PT, CT)
                                                                                                            **Symmetric Clustering**
                                                                                                                                              ← Binary to decimal(packerdestination, symmetric_star_length)
;← Search prefix_table(cluster_no_symmetric_star_length, packet destination, PT, CT)
                                                                                                                                                                                                                                                                                                                                                                        **Patricia Clustering**
                                                                                                                if((packet.cluster.no.incoming = 'Null) or packet.cluster_no_incoming doesn't exist) then
                                                                                                                                                                                                                     ← CTO[pointer_cluster_outgoing].cluster_no_outgoing
← CTO[pointer_cluster_outgoing].pointer_nexthop
← NT[pointer_nexthop].nexthop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CTO[pointer_cluster_outgoing].cluster_no_outgoing CTO[pointer_cluster_outgoing].pointer_nexthop
                                 Upon receiving an unicast packet this procedure is called in a CAST router
                                                                                                                                                                                                                                                                                                                                                                                                                 CTI[packet.cluster_no_incoming]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NT[pointer_nexthop].nexthop
                                                                                                                                                                                                                                                                                                                                             Sendpacket (cluster_no_outgoing, nexthop)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sendpacket (cluster_no_outgoing, nexthop)
Procedure: CAST Forward Packet(Packet packet)
                                                                                                                                                                                                                                                                                                                                                                                                                            1
                                                                                                                                                                                           oointer_cluster_outgoing ←
                                                                                                                                                                                                                                                                                                                                                                                                                                                          oointer_cluster_outgoing ←
                                                                                                                                                         cluster no symmetric
                                                                                                                                                                                                                                                                                                                                                                                                                 patricia start length
                                                                                                                                                                                                                                 cluster_no_outgoing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cluster_no_outgoing
                                                                                                                                                                                                                                                                      oointer_nexthop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ointer_nexthop
                                                                                                                                                                                                                                                                                                    nexthop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nexthop
```

-1G. 20C

The state of the s

DATA STRUCTURE

STRUCT CAST_ROUTING_TABLE

LINK-PREFIX_TABLE_PT

CONFLICT_TABLE_CT

CLUSTER_TABLE_NOOMING CTI

CLUSTER_TABLE_OUTGOING CTO

FIG. 21A

TABLES

CLUSTER TABLE (INCOMING)	POINTER (TO LINK-PREFIX TABLE	
CLUSTER TAB	NEXTHOP	

17 bits

32 bits

FIG. 21B

17 bits

Link Clustering

ALGORITHM

Upon receiving an unicast packet this procedure is called in a CAST router begin Procedure: CAST_Forward_Packet(Packet packet)

← CTI[packet.cluster_no_incoming] nexthop
← CTI[pointer_cluster_outgoing], pointer_link-prefix_table
← Search_link-prefix_table(pointer_link-prefix_table, 0, packet destination, PT, CT)
← CTO[pointer_cluster_outgoing].cluster_no_outgoing nexthop pointer_link-prefix_table

end

pointer_cluster_outgoing

FIG. 21C

Router A

Next Hop Links	L1,L3	1.2	L1,L3	L3	L2
Multicast Group	224.1.2.1	224.1.2.3	224.1.2.4	224.1.2.8	224.1.2.9

	Next Hop Links	L2,L3	174	12.1.3
Kouter B	Multicast Group Ne	224.1.2.3	224.1.2.5	224.1.2.9

224.1.2.9 Router B 224.1.2.5 224.1.2.3

Router A 224.1.2.4

224.1.2.9

224.1.2.1

224.1.2.8

224.1.2.3

2

 \Box Ľ S 9

L1,L3 L2,L3

L1,L2

FIG. 25

Cluster No. Incoming

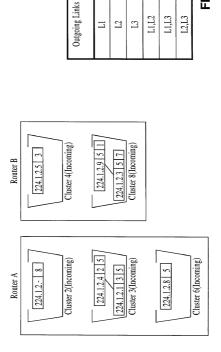
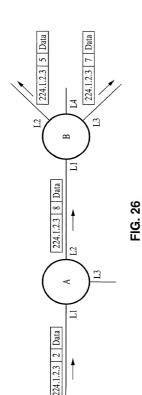


FIG. 24



 [224.1.2.3 | 8]

 [224.1.2.9 | 8]

FIG. 27

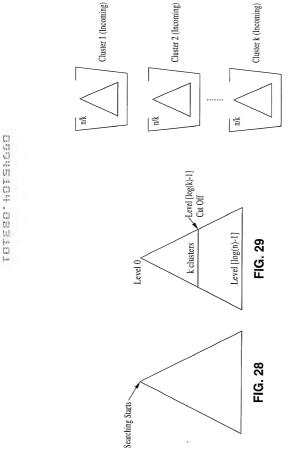
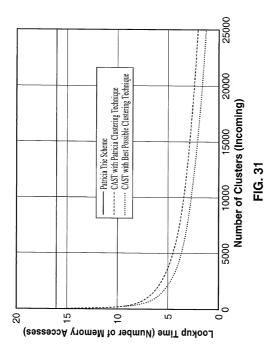
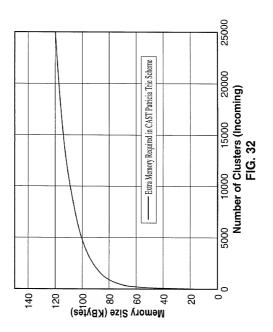
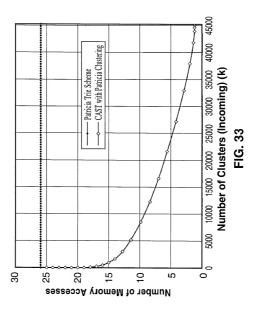
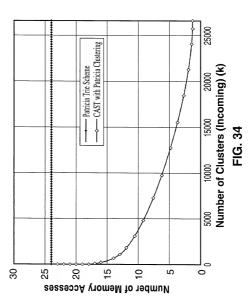


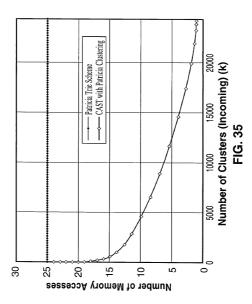
FIG. 30

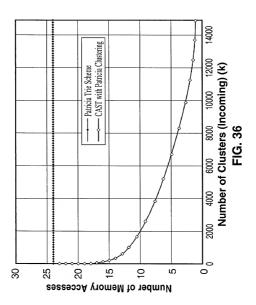


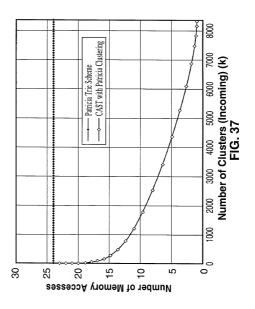












COUNTY COUNTY

Lookup Pow MAE-EAST MAE-WEST Pade 175 1090 175 1090 17		Actual Imple	Actual Implementation Results	esults		
ia) netric)	Scheme		Lookup F	ower (MPP	S)	:
ia) 6.75 0.90 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.0		MAE-EAST	MAE-WEST	PAC-BELL	AADS	PAIX
ia) 4.89 5.03 retric) 0.92 1.07	Patricia Trie	0.75	06:0	1.95	1.13	1.02
ia) 4.89 5.03 retric) 0.92 1.07	LPC	2.12	2.4]	2.90	3.53	4.17
netric) 0.92 1.07	CAST (Patricia)	4.89	5.03	6.32	6.53	7.81
111	CAST (Symmetric)	0.92	1.07	2.19	1.26	1.25
0.90	CAST (Link)	96:0	11.11	2.20	1.27	1.27

FIG. 38

	Multicast F	Multicast Results (40,000 Entries)	ries)		
Scheme		Lookup Power	wer		
	Maximum (Memory Accesses)	Average (Memory Accesses)	Lookup Power (KBytes)	Memory (KBytes)	Update Time (Memory Accesses)
AVL Tree	91	15.21	1.31	1026	15.21
Tag Switching	-	1.00	20:00	1040	15.24
IP Switching	91	2.42	8.26	1862	30.43
CAST (Link clustering, 2048 Clusters(In.))	L	4.17	23.98	688	15.18

FIG. 39

